



邮政编码: 100101 北京市朝阳区北辰东路 8 号汇宾大厦 A0601 北京市柳沈律师事务所 邵亚丽, 马莹	发文日期 
申请号: 2004100080407 	
申请人: 三星电子株式会社	
发明创造名称: 超宽带脉冲序列产生装置和方法, 及数据通信装置和方法	

## 第一次审查意见通知书

1.  应申请人提出的实审请求, 根据专利法第 35 条第 1 款的规定, 国家知识产权局对上述发明专利申请进行实质审查。  
 根据专利法第 35 条第 2 款的规定, 国家知识产权局决定自行对上述发明专利申请进行审查。
2.  申请人要求以其在:

KR 专利局的申请日 2003 年 03 月 11 日为优先权日,  
专利局的申请日 年 月 日为优先权日,  
专利局的申请日 年 月 日为优先权日,  
专利局的申请日 年 月 日为优先权日,  
专利局的申请日 年 月 日为优先权日。

申请人已经提交了经原申请国受理机关证明的第一次提出的在先申请文件的副本。  
 申请人尚未提交经原申请国受理机关证明的第一次提出的在先申请文件的副本, 根据专利法第 30 条的规定视为未提出优先权要求。

3.  经审查, 申请人于:

年 月 日提交的 不符合实施细则第 61 条的规定  
年 月 日提交的 不符合专利法第 33 条的规定  
年 月 日提交的

## 4. 审查针对的申请文件:

原始申请文件。  审查是针对下述申请文件的  
申请日提交的原始申请文件的权利要求第 项、说明书第 页、附图第 页;  
年 月 日提交的权利要求第 项、说明书第 页、附图第 页;  
年 月 日提交的权利要求第 项、说明书第 页、附图第 页;  
年 月 日提交的说明书摘要, 年 月 日提交的摘要附图。

5.  本通知书是在未进行检索的情况下作出的。

本通知书是在进行了检索的情况下作出的。

本通知书引用下述对比文献(其编号在今后的审查过程中继续沿用):

编号	文件号或名称	公开日期(或抵触申请的申请日)
1	WO 01/73712 A2	2001. 10. 4
2	CN 1394422A	2003. 1. 29

## 6. 审查的结论性意见:

关于说明书:

申请的内容属于专利法第 5 条规定的不授予专利权的范围。

21301  
2002. 8



回函请寄: 100088 北京市海淀区蓟门桥西土城路 6 号 国家知识产权局专利局受理处收  
(注: 凡寄给审查员个人的信函不具有法律效力)

## 第一次审查意见通知书正文

申请号：2004100080407

经审查，现提出如下审查意见。

### **一、权利要求1-11**

1、独立权利要求1要求保护一种无线数据发送和接收系统，对比文件1（WO 01/73712 A2）公开了一种检测超宽带脉冲信号的方法和设备，并具体公开了以下技术特征（见说明书第14页第18行至第31行，第15页第25行至第16页第2行，第16页第8行至第17行，附图7、8）：发送端602包括一个码源612（相当于权利要求1中的随机数产生器）用以产生伪随机码614，一个精确定时生成器608根据伪随机码614和发送信息信号616生成调制编码定时信号618，一个脉冲生成器622（相当于权利要求1中的随机间隔脉冲序列产生器）使用调制编码定时信号618生成输出脉冲；接收端702包括一个模板生成器728（相当于权利要求1中的模板脉冲序列产生器）用于产生模板信号脉冲序列730，一个互相关器710（相当于权利要求1中的随机数序列检测器）将730和接收信号脉冲序列708相乘和积分，以获得708的起始位置，一个检测器738（相当于权利要求1中的比较器）将根据710输出获得的脉冲和输出信号739与一个参考信号比较以判断接收到的脉冲序列代表的发送信息信号。权利要求1的技术方案与对比文件1公开的内容相比，其区别技术特征在于：权利要求1中的模板脉冲序列产生器是通过改变脉冲宽度来产生对于信号0和信号1的脉冲序列；比较器是基于有关随机数序列的起始点的信息，将对于信号0和信号1的脉冲序列与接收到的随机间隔脉冲序列进行比较，确定接收到的随机间隔脉冲序列代表的是0还是1；而对比文件1中的模板生成器是采用脉冲位置调制来代表不同的发送信息，比较器比较的是接收序列脉冲中构成一个单一数据比特的所有脉冲求积分得到的一个脉冲和信号。对比文件2(CN 1394422A)公开了一种数据传输方法，并具体公开了以下技术特征（见说明书第1页第31行至第2页第16行，图3B、5）：无线遥控装置发送的信号序列的“0”和“1”数据分别用L电平和H电平的不同脉冲宽度之比来区别，接收侧在接收波形的开始点开始识别接收波形，根据接收波形的脉冲宽度之比是否符合0和1的标准来判断接收的是数据0还是数据1。由此可见，上述区别技术特征均已在对比文件2中公开，且其在对比文件2中和本发明中所起的作用相同；都是用脉冲宽度来区别不同的数据信号，并且通过比较接收脉冲

与不同数据信号的标准脉冲来识别接收数据。也即对比文件2给出了将该区别技术特征应用到对比文件1的技术方案中，以进一步解决其技术问题的启示。因此，在对比文件1的基础上结合对比文件2，得出权利要求1的技术方案，对本领域的技术人员来说是显而易见的。因此，权利要求1不具备专利法第二十二条第三款规定的创造性。

2、权利要求2的附加技术特征为：所述随机间隔脉冲序列在超宽带上产生，该技术特征已被对比文件1公开（见说明书第8页第16行至第23行，图2A，2B）。因此，当权利要求1不具有创造性时，权利要求2也不具备专利法第二十二条第三款规定的创造性。

3、权利要求3对随机间隔脉冲序列产生器的序列生成方式进行了进一步限定，对比文件1已公开了对脉冲序列进行相位调制的方法（见说明书第9页第20行至第22行）。因此，当权利要求1不具有创造性时，权利要求3也不具备专利法第二十二条第三款规定的创造性。

4、权利要求4对模板脉冲序列产生器使用的随机数序列进行了进一步限定，对比文件1已公开了使用与发送端602相同的随机码来生成模板信号脉冲序列730的方法（见说明书第15页第28行至第30行）。因此，当权利要求1不具有创造性时，权利要求4也不具备专利法第二十二条第三款规定的创造性。

5、权利要求5对随机数序列检测器的检测方法进行了进一步限定，对比文件1还公开了以下技术特征（见说明书第21页第4行至第27行，附图10）：将接收信号脉冲序列和模板脉冲序列通过积分器进行移位积分求和（即卷积），若输出结果近似斜线，且最后值大于等于一个门限，则认为接收信号脉冲序列的起始位置与模板脉冲序列对齐。对脉冲序列而言，其冲击响应也是脉冲序列，而时间信号与其冲击响应在时间域中的卷积即相当于该信号在频率域的功率谱或能量谱，这是本领域技术人员的公知常识。因此，当权利要求1不具有创造性时，权利要求5也不具备专利法第二十二条第三款规定的创造性。

6、权利要求6对模板脉冲序列产生器产生的脉冲序列进行了进一步限定，对比文件1已公开了对脉冲序列进行相位调制的方法（见说明书第9页第20行至第22行）。因此，当权利要求1不具有创造性时，权利要求6也不具备专利法第二十二条第三款规定的创造性。

7、权利要求7对模板脉冲序列产生器产生的脉冲序列进行了进一步限定，对比文件2已公开了对不同数据信号进行脉冲宽度调制的方法（见说明书第1页第31行至第2页第16行，图3B）。因此，当权利要求1不具有创造性时，权利要求7也不具备专利法第二十二条第三款规定的创造性。

权利要求7中，附加部分的技术特征“模板脉冲序列产生器通过调整对于所述信号0的脉冲序列的脉冲宽度，使之不同于对于所述信号1的脉冲序列的脉冲宽度，来产生参考模板脉冲序列，以便在所述参考脉冲序列中区别0和1”，与其引用的权利要求1中模板脉冲序列产生器“通过改变脉冲宽度来产生对于信号0和1的脉冲序列”是实质相同的技术特征。因此，权利要求7的所有技术特征都已记载在权利要求1中，造成权利要求7不简要，不符合专利法实施细则第二十条第一款有关权利要求应当简要的规定。

8、独立权利要求8要求保护一种无线数据接收装置，对比文件1公开了一种检测超宽带脉冲信号的方法和设备，并具体公开了以下技术特征（见说明书第15页第25行至第16页第2行，第16页第8行至第17行，附图8）：接收端702包括一个模板生成器728（相当于权利要求8中的模板脉冲序列产生器）用于产生模板信号脉冲序列730，一个互相关器710（相当于权利要求8中的随机数序列检测器）将730和接收信号脉冲序列708进行相乘和积分，以获得708的起始位置，一个检测器738（相当于权利要求8中的比较器）将根据710输出获得的脉冲和输出信号739与一个参考信号比较以判断接收到的脉冲序列代表的发送信息。权利要求8的技术方案与对比文件1公开的内容相比，其区别技术特征在于：权利要求8中的模板脉冲序列产生器是通过改变脉冲宽度来产生对于信号0和信号1的脉冲序列，比较器是基于有关随机数序列的起始点的信息，将对于信号0和信号1的脉冲序列与接收到的随机间隔脉冲序列进行比较，确定接收到的随机间隔脉冲序列代表的是0还是1；而对比文件1中的模板生成器是采用脉冲位置调制来代表不同的发送信息，比较器比较的是接收序列脉冲中构成一个单一数据比特的所

有脉冲求积分得到的一个脉冲和信号。对比文件2公开了一种数据传输方法，并具体公开了以下技术特征（见说明书第1页第31行至第2页第16行，图3B、5）：无线遥控装置发送的信号序列的“0”和“1”数据分别用L电平和H电平的不同脉冲宽度之比来区别，接收侧在接收波形的开始点开始识别接收波形，根据接收波形的脉冲宽度之比是否符合0和1的标准来判断接收的是数据0还是数据1。由此可见，上述区别技术特征已在对比文件2中公开，且其在对比文件2中和本发明中所起的作用相同，都是用脉冲宽度来区别不同的数据信号，并且通过比较接收脉冲与不同数据信号的标准脉冲来识别接收数据。也即对比文件2给出了将该区别技术特征应用到对比文件1的技术方案中，以进一步解决其技术问题的启示。因此，在对比文件1的基础上结合对比文件2，得出权利要求8的技术方案，对本领域的技术人员来说是显而易见的。因此，权利要求8不具备专利法第二十二条第三款规定的创造性。

9、权利要求9-11的附加技术特征分别与权利要求2、6、7的附加技术特征一一对应。因此，基于评述权利要求2、6、7的相似理由，当权利要求8不具有创造性时，权利要求9-11也不具备专利法第二十二条第三款规定的创造性。

10、权利要求11的附加技术特征与权利要求7的附加技术特征一一对应。因此，权利要求11也存在类似于权利要求7的不简要的缺陷，不符合专利法实施细则第二十条第一款的规定。

## 二、权利要求12-14、26—28

11、权利要求12、14、26-28中用上位概念“第一脉冲序列”和“第二脉冲序列”概括了一个较宽的保护范围，但在说明书中仅给出了信号0的脉冲序列和信号1的脉冲序列的具体实施方式。依据说明书所记载的内容，本领域的技术人员难以从上述具体的脉冲序列推广到第一脉冲序列和第二脉冲序列。因此，上述权利要求均得不到说明书的支持，不符合专利法第二十六条第四款的规定。申请人应当将上述上位概念具体限定为“信号0的脉冲序列”和“信号1的脉冲序列”。

12、独立权利要求12要求保护一种UWB脉冲序列产生装置，对比文件1公开了一种

检测超宽带脉冲信号的方法和设备，并具体公开了以下技术特征（见说明书第9页第20行至第22行，第14页第18行至第31行，附图7）：码源612产生伪随机码614，一个精确定时生成器608根据614和发送信息信号616生成调制编码定时信号618，脉冲生成器622使用调制编码定时信号618生成输出脉冲；脉冲序列可采用相位调制来传送信息。虽然对比文件1没有直接公开生成不同的第一脉冲序列和第二脉冲序列，但是在要发送信息不同时，脉冲生成器采用相位调制，必然会生成相位不同的输出序列。因此，对比文件1已经隐含公开了脉冲生成器具有生成第一脉冲序列和第二脉冲序列的功能。由此可见，权利要求12与对比文件1的区别技术特征在于：权利要求12中是通过两个脉冲序列生成器：第一脉冲序列产生器和第二脉冲序列产生器，来产生不同的脉冲序列；而对比文件1中是通过一个脉冲生成器来产生不同的脉冲序列。而能够生成两种脉冲序列的脉冲生成器用两个独立的脉冲序列产生器来实现，这是本领域技术人员的常用技术手段。在对比文件1的基础上结合上述常用技术手段，得出权利要求12的技术方案，对本领域的技术人员来说是显而易见的。因此，权利要求12不具备专利法第二十二条第三款规定的创造性。

13、权利要求13对脉冲序列的调制方式进行了具体限定。而在进行相位调制时，根据传输的具体要求，采用二进制移相键控方法或正交移相键控方法，是本领域技术人员的常用技术手段。因此，当权利要求12不具有创造性时，权利要求13也不具备专利法第二十二条第三款规定的创造性。

权利要求13中的“信号0的脉冲序列”和“信号1的脉冲序列”在其引用的权利要求12中没有出现，导致权利要求13的保护范围不清楚，不符合专利法实施细则第二十条第一款的规定。

权利要求13的“二进制移相键控（BPSK）”和“正交移相键控（QPSK）”中，括号中的“BPSK”和“QPSK”分别是括号前内容的英文缩写，不是附图标记，也不属于置于括号中的必要情形，因此上述括号使用不当，不符合专利法实施细则第二十条第四款的规定。申请人应将括号删除，直接表述为“二进制移相键控BPSK”和“正交移相键控QPSK”即可。

14、独立权利要求14要求保护一种UWB脉冲序列产生装置，对比文件1公开了一种

检测超宽带脉冲信号的方法和设备，并具体公开了以下技术特征（见说明书第14页第18行至第31行，附图7）：码源612产生伪随机码614，一个精确定时生成器608根据614和发送信息信号616生成调制编码定时信号618，脉冲生成器622使用调制编码定时信号618生成输出脉冲。虽然对比文件1没有直接公开生成不同的第一脉冲序列和第二脉冲序列，但是在要发送信息不同时，脉冲生成器必然会生成不同的输出序列。因此，对比文件1已经隐含公开了脉冲生成器具有生成第一脉冲序列和第二脉冲序列的功能。由此可见，权利要求14与对比文件1的区别技术特征在于：权利要求14中有两个脉冲序列产生器，其中第二脉冲序列产生器是通过改变脉冲宽度来产生第二脉冲序列，而对比文件1中是一个脉冲生成器，通过改变脉冲位置来产生不同的脉冲序列。对比文件2公开了一种数据传输方法，并具体公开了以下技术特征（见说明书第1页第31行至第2页第16行，图3B）：无线遥控装置发送的信号序列的“0”和“1”数据分别用L电平和H电平的不同脉冲宽度之比来区别。由此可见，用脉冲宽度区分信号已在对比文件2中公开，且其在对比文件2中和本发明中所起的作用相同。也即对比文件2给出了将该区别技术特征应用到对比文件1的技术方案中，以进一步解决其技术问题的启示。而将能够生成两种脉冲序列的脉冲生成器用两个独立的脉冲序列产生器来实现，是本领域技术人员的常用技术手段。<sup>1</sup>因此，在对比文件1的基础上结合对比文件2和上述常用技术手段，得出权利要求14的技术方案，对本领域的技术人员来说是显而易见的。因此，权利要求14不具备专利法第二十二条第三款规定的创造性。

权利要求14第5行“比第一UWB脉冲序列的脉冲宽度的宽预定的度数”表达不通顺，可将第二个“的”去除，表述为“比第一UWB脉冲序列的脉冲宽度宽预定的度数”。

15、权利要求26、28实质上是与产品权利要求12、14对应的方法权利要求，其步骤与权利要求12、14中各装置的组成部分一一对应。因此，参见对权利要求12、14的评述，权利要求26、28也不具备专利法第二十二条第三款规定的创造性。

16、权利要求27对脉冲序列的调制方式进行了具体限定。而在进行相位调制时，根据传输的具体要求，采用二进制移相键控方法或正交移相键控方法，是本领域技术人员的常用技术手段。因此，当权利要求26不具有创造性时，权利要求27也不具备专利法第二十二条第三款规定的创造性。

17、权利要求28第4行“比第一UWB脉冲序列的脉冲宽度的宽预定的度数”表达不通顺，可将第二个“的”去除，表述为“比第一UWB脉冲序列的脉冲宽度宽预定的度数”。

### 三、权利要求15-25

18、独立权利要求15要求保护一种无线数据发送/接收方法，对比文件1公开了一种检测超宽带脉冲信号的方法和设备，并具体公开了以下技术特征（见说明书第14页第18行至第31行，第15页第25行至第16页第2行，第16页第8行至第17行，附图7、8）：发送端码源612产生伪随机码序列614（相当于权利要求15中的步骤a），精确定时生成器608根据614和发送信息信号616生成调制编码定时信号618，脉冲生成器622使用618生成输出脉冲（相当于权利要求15中的步骤b）；接收端模板生成器728产生模板信号脉冲序列730（相当于权利要求15中的步骤c），天线704接收传输脉冲无线信号706生成接收信号脉冲序列708，互相关器710将730和708相乘和积分以获得708的起始位置（相当于权利要求15中的步骤d），检测器738将根据710输出获得的脉冲和输出信号739与一个参考信号比较以判断接收到的脉冲序列代表的发送信息。权利要求1的技术方案与对比文件1公开的内容相比，其区别技术特征在于：权利要求1中，在步骤(d)之后，基于有关随机数序列的起始点的信息，产生对于信号0和信号1的参考脉冲序列，将对于信号0和信号1的参考脉冲序列与接收到的随机间隔脉冲序列进行比较，来判定接收到随机间隔脉冲序列代表的是0还是1；而对比文件1中的检测是将接收序列脉冲中构成一个单一数据比特的所有脉冲求积分得到的一个脉冲和信号，将该信号与标准参考值进行比较，判断接收到的脉冲序列代表的发送信息。对比文件2公开了一种数据传输方法，并具体公开了以下技术特征（见说明书第1页第31行至第2页第16行，图3B、5）：无线遥控装置发送的信号序列的“0”和“1”数据分别用L电平和H电平的不同脉冲宽度之比来区别，接收侧在接收波形的开始点开始识别接收波形，根据接收波形的脉冲宽度之比是否符合0和1的标准来判断接收的是数据0还是数据1。虽然对比文件2没有直接公开先生成数据0和1的参考脉冲波形的步骤，但是接收侧要进行识别判断，必然先获知0和1的参考脉冲波形，再根据0和1的参考脉冲波形来进行比较。因此，对比文件2隐含公开了先生成参考脉冲波形再进行判断识别的步骤。由此可见，上述区别技术特征均已在对比文件2中公开，且其在对比文件2中和本发明中所起的作用相同，都是先生成不同的参考脉冲，再将其与接收脉冲比较来识别接收数

据。也即对比文件2给出了将该区别技术特征应用到对比文件1的技术方案中，以进一步解决其技术问题的启示。因此，在对比文件1的基础上结合对比文件2，得出权利要求15的技术方案，对本领域的技术人员来说是显而易见的。因此，权利要求15不具备专利法第二十二条第三款规定的创造性。

19、权利要求16的附加技术特征为：所述随机间隔脉冲序列在超宽带上产生，该技术特征已被对比文件1公开（见说明书第8页第16行至第23行，图2A，2B）。因此，当权利要求15不具有创造性时，权利要求16也不具备专利法第二十二条第三款规定的创造性。

20、权利要求17对步骤（b）中随机间隔脉冲序列的产生方法进行了进一步限定，对比文件1已公开了对脉冲序列进行相位调制的方法（见说明书第9页第20行至第22行）。因此，当权利要求15不具有创造性时，权利要求17也不具备专利法第二十二条第三款规定的创造性。

21、权利要求18对步骤（c）中参考模板脉冲序列的产生方法进行了进一步限定，对比文件1已公开了使用与发送端602相同的随机码来生成模板信号脉冲序列730的方法（见说明书第15页第28行至第30行）。因此，当权利要求15不具有创造性时，权利要求18也不具备专利法第二十二条第三款规定的创造性。

22、权利要求19对步骤（d）中检测起始点的方法进行了进一步限定，对比文件1还公开了以下技术特征（见说明书第21页第4行至第27行，附图10）：将接收信号脉冲序列和模板脉冲序列通过积分器进行移位积分求和（即卷积），若输出结果近似斜线，且最后值大于等于一个门限，则认为接收信号脉冲序列的起始位置与模板脉冲序列对齐。对脉冲序列而言，其冲击响应也是脉冲序列，而时间信号与其冲击响应在时间域中的卷积即相当于该信号在频率域的功率谱或能量谱，这是本领域技术人员的公知常识。因此，当权利要求15不具有创造性时，权利要求19也不具备专利法第二十二条第三款规定的创造性。

23、权利要求20对步骤(e)中产生的参考脉冲序列进行了进一步限定，对比文件1已公开了对脉冲序列进行相位调制的方法（见说明书第9页第20行至第22行）。因此，当权利要求15不具有创造性时，权利要求20也不具备专利法第二十二条第三款规定的创造性。

24、权利要求21对步骤(e)中产生的参考脉冲序列进行了进一步限定，对比文件2已公开了对不同数据信号进行脉冲宽度调制的方法（见说明书第1页第31行至第2页第16行，图3B）。因此，当权利要求15不具有创造性时，权利要求21也不具备专利法第二十二条第三款规定的创造性。

25、独立权利要求22要求保护一种无线数据接收方法，对比文件1公开了一种检测超宽带脉冲信号的方法和设备，并具体公开了以下技术特征（见说明书第15页第25行至第16页第2行，第16页第8行至第17行，附图8）：接收端模板生成器728产生模板信号脉冲序列730（相当于权利要求15中的步骤a），天线704接收传输脉冲无线信号706生成接收信号脉冲序列708，互相关器710将730和708相乘和积分以获得708的起始位置（相当于权利要求15中的步骤b），检测器738将根据710输出获得的脉冲和输出信号739与一个参考信号比较以判断接收到的脉冲序列代表的发送信息。权利要求1的技术方案与对比文件1公开的内容相比，其区别技术特征在于：权利要求1中，在步骤(c)之后，基于有关随机数序列的起始点的信息，产生对于信号0和信号1的参考脉冲序列，将对于信号0和信号1的参考脉冲序列与接收到的随机间隔脉冲序列进行比较，来判定接收到随机间隔脉冲序列代表的是0还是1；而对比文件1中的检测是将接收序列脉冲中构成一个单一数据比特的所有脉冲求积分得到的一个脉冲和信号，将该信号与标准参考值进行比较，判断接收到的脉冲序列代表的发送信息。对比文件2公开了一种数据传输方法，并具体公开了以下技术特征（见说明书第1页第31行至第2页第16行，图3B、5）：无线遥控装置发送的信号序列的“0”和“1”数据分别用L电平和H电平的不同脉冲宽度之比来区别，接收侧在接收波形的开始点开始识别接收波形，根据接收波形的脉冲宽度之比是否符合0和1的标准来判断接收的是数据0还是数据1。虽然对比文件2没有直接公开先生成数据0和1的参考脉冲波形的步骤，但是接收侧要进行识别判断，必然先获知0和1的参考脉冲波形，再根据0和1的参考脉冲波形来进行比较。因此，

对比文件2隐含公开了先生成参考脉冲波形再进行判断识别的步骤。由此可见，上述区别技术特征已在对比文件2中公开，且其在对比文件2中和本发明中所起的作用相同，都是先生成不同的参考脉冲，再将其与接收脉冲比较来识别接收数据。也即对比文件2给出了将该区别技术特征应用到对比文件1的技术方案中，以进一步解决其技术问题的启示。因此，在对比文件1的基础上结合对比文件2，得出权利要求22的技术方案，对本领域的技术人员来说是显而易见的。因此，权利要求22不具备专利法第二十二条第三款规定的创造性。

26、权利要求23-25的附加技术特征分别与权利要求16、20、21的附加技术特征一一对应。因此，基于评述权利要求16、20、21的相似理由，当权利要求22不具有创造性时，权利要求23-25也不具备专利法第二十二条第三款规定的创造性。

#### 四、权利要求29-30

27、权利要求29、30要求保护“一种计算机可读记录介质”，其实质是要求保护该介质上记载的“用于记录执行UWB脉冲产生方法的程序”，而计算机程序属于专利法第二十五条第一款第（二）项所述的智力活动的规则和方法的范围，不属于专利保护的客体。因此，权利要求29、30不能被授予专利权。

28、权利要求30第5行“比第一UWB脉冲序列的脉冲宽度的宽预定的度数”表达不通顺，可将第二个“的”去除，表述为“比第一UWB脉冲序列的脉冲宽度宽预定的度数”。

基于上述理由，本申请的权利要求1-28不具备创造性，29、30是专利法规定不授予专利权的对象，同时说明书中也没有记载其他任何可以授予专利权的实质性内容，因而即使申请人对权利要求进行重新组合或根据说明书记载的内容作进一步的限定，本申请也不具备被授予专利权的前景。如果申请人不能在本通知书规定的答复期限内提出表明本申请具有创造性的充分理由，本申请将被驳回。

审查员：鲁艳萍

代码：9671

The Patent office of the People's Republic Of China

Address: No. 6 XITUCHENG ROAD, JIMEN BRIDGE, HAI DIAN DISTRICT, BEIJING

Post Code: 100088

Applicant:	SAMSUNG ELECTRONICS CO., LTD	ISSUING DATE:
Agent:	Yi / Show	
Application No.	2006100080140	2006.02.10
Title:	UWB PULSE SEQUENCE GENERATION APPARATUS	

THE FIRST OFFICE ACTION

1.  The applicant filed a request for substantive examination on Year \_\_\_\_\_ Month \_\_\_\_\_ Day \_\_\_\_\_ according to Article 35 Paragraph 1 of the Patent Law. The examiner has conducted a substantive examination to the above-mentioned patent application.

According to Article 35 paragraph 2 of the Patent Law. Chinese Patent office decided on its own initiative to conduct a substantive examination to the above-mentioned patent application.

2.  The applicant requested to take  
Year 03 Month 03 Day 11 on which an application is filed with the KR patent office as the priority date.

Year \_\_\_\_\_ Month \_\_\_\_\_ Day \_\_\_\_\_ on which an application is filed with the \_\_\_\_\_ patent office as the priority date.

Year \_\_\_\_\_ Month \_\_\_\_\_ Day \_\_\_\_\_ on which an application is filed with the \_\_\_\_\_ patent office as the priority date.

The applicant has submitted the copy of the earliest application document certified by the competent authority of that country.

According to Article 30 of the Patent Law, if the applicant has not yet submitted the copy of the earliest application document certified by the competent authority of that country, the declaration for Priority shall be deemed not to have been made.

This application is a PCT application.

3.  The applicant submitted the amended document(s) on Year \_\_\_\_\_ Month \_\_\_\_\_ Day \_\_\_\_\_ and Year \_\_\_\_\_ Month \_\_\_\_\_ Day after examination, \_\_\_\_\_ submitted on Year \_\_\_\_\_ Month \_\_\_\_\_ Day \_\_\_\_\_ is/are not accepted.  
\_\_\_\_\_ submitted on Year \_\_\_\_\_ Month \_\_\_\_\_ Day \_\_\_\_\_ is/are not accepted

because the said amendment(s)  is/are not in conformity with Article 33 of the Patent Law.

is/are not in conformity with Rule 51 of the Implementing Regulations..

The concrete reason(s) for not accepting the amendment(s) is/are presented on the text of Office Action.

4.  The examination has been conducted based on the application text as originally filed.

The examination has been conducted based on the following text(s):

page(s) \_\_\_\_\_ of the specification, Claim(s) \_\_\_\_\_, and figure(s) \_\_\_\_\_ in the original text of the application submitted on the filing day.

page(s) \_\_\_\_\_ of the specification, claim(s) \_\_\_\_\_, and figure(s) \_\_\_\_\_ submitted on Year \_\_\_\_\_ Month \_\_\_\_\_ Day \_\_\_\_\_

page(s) \_\_\_\_\_ of the specification, claim(s) \_\_\_\_\_, and figure(s) \_\_\_\_\_ submitted on Year \_\_\_\_\_ Month \_\_\_\_\_ Day \_\_\_\_\_

5.  This notification was made without undergoing search.

This notification was made with undergoing search.

The following reference document(s) is/are cited:(the reference numeral(s) thereof will be used in the examination procedure hereafter)

NO.	Reference No. or Title	Publishing Date
1	WO 01/73712 A2	2001.10.4
2	CN 1394422A	2003.1.29
3		
4		
5		

6. Concluding comments

on the specification:

- The contents of the application are in contrary to Article 5 of the Patent Law and therefore are not patentable.
- The contents of the application do not possess the practical applicability as prescribed in Paragraph 4 of Article 5 of the Patent Law.
- The specification is not in conformity with the provision of Paragraph 3 of Article 26 of the Patent Law.
- The presentation of the specification is not in conformity with the provision of Rule 18 of the Implementing Regulations.

on the claims:

- Claim(s) 29, 30 belong(s) to non-patentable subject matter as prescribed in Article 25 of the Patent law.
- Claim(s) \_\_\_\_\_ do(es) not comply with the definition of a patent as provided in Rule 2 paragraph 1 of the Implementing Regulations.
- Claim(s) \_\_\_\_\_ do(es) not possess novelty as requested by Article 22 paragraph 2 of the Patent Law.
- Claim(s) 1-28 do(es) not possess inventiveness as requested by Article 22 paragraph 3 of the Patent Law.
- Claim(s) \_\_\_\_\_ do(es) not possess practical applicability as requested by Article 22 paragraph 4 of the Patent Law.
- Claim(s) 12, 14, 26-28 do(es) not comply with the provision of Article 26 paragraph 4 of the Patent Law.
- Claim(s) \_\_\_\_\_ do(es) not comply with the provision of Article 31 paragraph 1 of the Patent Law.
- Claim(s) 7, 11, 13 do(es) not comply with provision of Rule 20 of the Implementing Regulations.
- Claim(s) \_\_\_\_\_ do(es) not comply with provision of Rule 21 of the Implementing Regulations.
- Claim(s) \_\_\_\_\_ do(es) not comply with provision of Rule 22 of the Implementing Regulations.
- Claim(s) \_\_\_\_\_ do(es) not comply with provision of Rule 23 of the Implementing Regulations.
- Claim(s) \_\_\_\_\_ do(es) not comply with the provision of Article 9 of the Patent Law.
- Claim(s) \_\_\_\_\_ do(es) not comply with the provision of Rule 13 paragraph 1 of the Implementing Regulations.

The detailed analysis for the above concluding comments is presented on the text of this Office Action.

7. Based on the above concluding comments, the examiner is of the opinion that

The applicant should amend the application document(s) in accordance with the requirement as specified in the Office Action.

The applicant should, in his observation, expound the patentability of the application, amend the defects pointed out in the Office Action; or the application can hardly be approved.

The examined deems that the application lacks substantive features to make it patentable. Therefore, the application will be rejected if no convincing reasons are provided to prove its patentability.

8. The applicant should pay attention to the following matters:

- (1) According to Article 37 of the Patent Law, the applicant is required to submit his observations within Four months upon receipt of this Office Action. If the time limit for making response is not met without any justified reason, the application to have been withdraw.
- (2) The amendment(s) made by the applicant must meet the requirements of Article 33 of the Patent Law. The amended text should be in duplicate, its format should conform to the related confinement in the Guidance for Examination.
- (3) The applicant and/or the agent should not go to the Chinese Patent Office to interview the examiner without being invited.
- (4) The observation and/of the amended document(s) must be mailed or delivered to the Receiving Section of the Chinese Patent Office. No legal effect shall apply for any document(s) that not mailed to or reached the Receiving Section.

9. The text of this Office Action contains 10 page(s), and has the following attachment(s):

2 copies of the cited references, all together 69 pages.

Examination Dept. No. \_\_\_\_\_ Examiner \_\_\_\_\_ Seal of Examination Dept. for business only \_\_\_\_\_

(if the Office Action wasn't stamped by the specified seal, it has no legal effect)

## TEXT OF THE FIRST OFFICE ACTION

After examination, the opinions are now provided as follows:

I. Claims 1 to 11

1. The independent claim 1 is for a wireless data transmitting and receiving system, whereas Reference 1 (WO 01/73712 A2) discloses a method and apparatus for detecting an UltraWide Band pulse signal with the detailed technical features as follows (refer to lines 18 to 31 of page 14, line 25 of page 15 to line 2 of page 16, lines 8 to 17 of page 16 of the specification and Figures 7 and 8): transmitting terminal 602 comprises a code source 612 (corresponds to the random number generator in claim 1) for generating a pseudo random code 614; a precision timing generator 608 generates a modulated, coded timing signal 618 according to the pseudo random code 614 and the transmission information signal 616; a pulse generator 622 (corresponds to the random-interval pulse sequence generator in claim 1) generates output pulses using the modulated, coded timing signal 618; receiving terminal 702 comprises a template generator 728 (corresponds to the template pulse sequence generator in claim 1) for producing a train of template signal pulses 730; a cross-correlator 710 (corresponds to the random number sequence detector in claim 1) multiplies and integrates 730 and the reception signal pulse train 708, so as to obtain the initial position of 708; a detector 738 (corresponds to the comparator in claim 1) compares the pulses obtained from the output of 710 and the output signal 739 with a reference signal so as to determine the transmission information signal indicated by the received pulse sequence. The distinctive technical features between claim 1 and the contents disclosed in Reference 1 lie in that the template pulse sequence generator in claim 1 is for generating pulse sequences for a signal 0 and a signal 1 by changing widths of pulses, and the comparator is for comparing the pulse sequences for the signal 0 and the signal 1 based on the start point information regarding the random number sequence with the received random-interval pulse sequence and determining whether the received random-interval pulse sequence indicates 0 or 1; whereas the template generator in Reference 1 is for indicating different transmission information by using pulse position modulation, and the comparator is for comparing a pulse sum signal obtained by integrating all the pulses constituting a single data bit in the reception sequence pulses. Reference 2 (CN 1394422A) discloses a data transmission method with the detailed technical features as follows (refer to paragraph 0004 to paragraph 0005 of the specification and Figures 3B and 5 of the family patent application EP 1235400 of CN 1394422A): data "0" and "1" of the signal sequences transmitted by the wireless remote control are distinguished by the ratio of different pulse widths of L and H levels, the reception side starts to recognize the reception

waveform at the start point of it, and determines whether the received data is data 0 or data 1 according to whether the ratio of widths of pulses of the reception waveforms conforms to the 0's and 1's standard. Thus it can be seen that the above distinctive technical features have been disclosed in Reference 2, furthermore, they perform identical functions in Reference 2 and the present invention, both for distinguishing different data signals using pulse widths and identifying reception data by comparing the reception pulses with the standard pulses of different data signals, that is, Reference 2 has provided the inspiration of applying said distinctive technical features into the technical solution of Reference 1 so as to further solve the technical problem. Therefore, it is obvious for a person skilled in the art to obtain the technical solution of claim 1 by combining Reference 2 based on Reference 1. Thus, claim 1 does not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law.

2. The additional technical feature of claim 2 is that: the random-interval pulse sequence is generated at an Ultra Wide Band, which has been disclosed by Reference 1 (refer to lines 16 to 23 of page 8 of the specification and Figures 2A and 2B). Thus, when claim 1 does not possess inventiveness, claim 2 does not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law either.

3. Claim 3 further defines the sequence generation mode of the random-interval pulse sequence generator, Reference 1 has disclosed the method for phase modulating pulse sequences (refer to lines 20 to 22 of page 9 of the specification). Thus, when claim 1 does not possess inventiveness, claim 3 does not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law either.

4. Claim 4 further defines the random number sequence used by the template pulse sequence generator, whereas Reference 1 has disclosed the method for generating template signal pulse sequence 730 by using a random code similar to transmitting terminal 602 (refer to lines 28 to 30 of page 15 of the specification). Thus, when claim 1 does not possess inventiveness, claim 4 does not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law either.

5. Claim 5 further defines the detection method of the random number sequence detector, whereas Reference 1 further discloses the following technical features (refer to lines 4 to 27 of page 21 of the specification and Figure 10): shift integrating and summing (i.e. convoluting) the reception signal pulse sequence and the template pulse sequence via an integrator, if the output result is approximately diagonal and the final value is bigger than or equal to a threshold, it is assumed that the initial position of the reception signal pulse sequence aligns with the template pulse sequence. As for the pulse sequence, the impulse response is also a pulse sequence, and the convolution of the time signal and the impulse response in the time domain corresponds to the power spectrum or energy spectrum of said signal in the frequency domain, which is the common knowledge in the art. Therefore, when claim 1 does not possess inventiveness, claim 5 does not possess inventiveness as prescribed in Article 22,

clause 3 of the Chinese Patent Law either.

6. Claim 6 further defines the pulse sequence generated by the template pulse sequence generator, whereas Reference 1 has disclosed the method for phase modulating pulse sequences (refer to lines 20 to 22 of page 9 of the specification). Thus, when claim 1 does not possess inventiveness, claim 6 does not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law either.

7. Claim 7 further defines the pulse sequences generated by the template pulse sequence generator, whereas Reference 2 has disclosed the method for modulating pulse widths of different data signals (refer to paragraph 0004 to paragraph 0005 of the specification and Figure 3B of the family patent application EP 1235400 of CN 1394422A). Thus, when claim 1 does not possess inventiveness, claim 7 does not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law either.

Claim 7 defines in the additional portion the technical feature of “the template pulse sequence generator generates reference pulse sequences by adjusting the widths of the pulses of the pulse sequence for the signal 0 to be different from the widths of the pulses of the pulse sequence for the signal 1 to a predetermined degree, so as to distinguish between 0's and 1's in the reference pulse sequences”, which is substantially the same with the technical feature of the template pulse sequence generator “generates pulse sequences for a signal 0 and a signal 1 by changing widths of pulses” in claim 1 referred to by said claim. Thus, all the technical features of claim 7 have been recorded in claim 1, which renders claim 7 being not concise and does not comply with the provision of Rule 20, paragraph 1 of the Implementing Regulations of the Chinese Patent Law which prescribes that the claims shall be concise.

8. The independent claim 8 is for a wireless data receiving apparatus, whereas Reference 1 disclosed a method and apparatus for detecting an UltraWide Band pulse signal with the detailed technical features as follows (refer to line 25 of page 15 to line 2 of page 16, lines 8 to 17 of page 16 of the specification and Figures 7 and 8): receiving terminal 702 comprises a template generator 728 (corresponds to the template pulse sequence generator in claim 8) for producing a train of template signal pulses 730; a cross-correlator 710 (corresponds to the random number sequence detector in claim 8) multiplies and integrates 730 and the reception signal pulse train 708, so as to obtain the initial position of 708; a detector 738 (corresponds to the comparator in claim 8) compares the pulses obtained from the output of 710 and the output signal 739 with a reference signal so as to determine the transmission information signal indicated by the received pulse sequence. The distinctive technical features between claim 8 and the contents disclosed in Reference 1 lie in that the template pulse sequence generator in claim 8 is for generating pulse sequences for a signal 0 and a signal 1 by changing widths of pulses, and the comparator is for

comparing the pulse sequences for the signal 0 and the signal 1 based on the start point information regarding the random number sequence with the received random-interval pulse sequence and determining whether the received random-interval pulse sequence indicates 0 or 1; whereas the template generator in Reference 1 is for indicating different transmission information by using pulse position modulation, and the comparator is for comparing a pulse sum signal obtained by integrating all the pulses constituting a single data bit in the reception sequence pulses. Reference 2 discloses a data transmission method with the detailed technical features as follows (refer to paragraph 0004 to paragraph 0005 of the specification and Figures 3B and 5 of the family patent application EP 1235400 of CN 1394422A): data “0” and “1” of the signal sequences transmitted by the wireless remote control are distinguished by the ratio of different pulse widths of L and H levels, the reception side starts to recognize the reception waveform at the start point of it, and determines whether the received data is data 0 or data 1 according to whether the ratio of widths of pulses of the reception waveforms conforms to the 0’s and 1’s standard. Thus it can be seen that the above distinctive technical features have been disclosed in Reference 2, furthermore, they perform identical functions in Reference 2 and the present invention, both for distinguishing different data signals using pulse widths and identifying reception data by comparing the reception pulses with the standard pulses of different data signals, that is, Reference 2 has provided the inspiration of applying said distinctive technical features into the technical solution of Reference 1 so as to further solve the technical problem. Therefore, it is obvious for a person skilled in the art to obtain the technical solution of claim 8 by combining Reference 2 based on Reference 1. Thus, claim 8 does not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law.

9. The additional technical features of claims 9 to 11 corresponds to those of claims 2, 6 and 7, respectively. Therefore, based on similar reasons as the comments on claims 2, 6 and 7, when claim 8 does not possess inventiveness, claims 9 to 11 do not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law either.

10. The additional technical feature of claim 11 corresponds to that of claim 7, thus claim 11 also has a similar defect of being not concise as claim 7, which does not comply with the provision of Rule 20, paragraph 1 of the Implementing Regulations of the Chinese Patent Law.

## II. Claims 12 to 14 and 26 to 28

11. Claims 12, 14 and 26 to 28 adopt superior concepts of “a first pulse sequence” and “a second pulse sequence”, which have covered overbroad protection scopes, however, the specification only provides the mode of carrying out of the invention of the pulse sequence for a signal 0 and the pulse sequence for a signal 1. According to the contents recorded in the specification, it is difficult for a person skilled in the art to generalize the above detailed pulse sequences to the first pulse sequence and the

second pulse sequence. Therefore, the above claims can not be supported by the specification, which does not comply with the provision of Article 26, clause 4 of the Chinese Patent Law. The applicant should define the above superior concepts in details as “the pulse sequence for a signal 0” and “the pulse sequence for a signal 1”.

12. The independent claim 12 is for a UWB pulse sequence generation apparatus, whereas Reference 1 has disclosed a method and apparatus for detecting an UltraWide Band pulse signal with the detailed technical features as follows (refer to lines 20 to 22 of page 9, lines 18 to 31 of page 14 of the specification and Figure 7): the code source 612 generates a pseudo random code 614; a precision timing generator 608 generates a modulated, coded timing signal 618 according to 614 and the transmission information signal 616; a pulse generator 622 generates output pulses using the modulated, coded timing signal 618; and the pulse sequences can transmit information by using phase modulation. Although Reference 1 fails to disclose directly that generating the different first pulse sequence and second pulse sequence, the pulse generator, by adopting phase modulation, must generate the output sequences with different phases when the information to be transmitted are different. Thus Reference 1 has disclosed implicitly that the pulse generator has the function of generating a first pulse sequence and a second pulse sequence. Thus it can be seen that the distinctive technical features between claim 12 and Reference 1 lie in that: claim 12 is for generating different pulse sequences via two pulse sequence generators: a first pulse sequence generator and a second pulse sequence generator; whereas Reference 1 is for generating different pulse sequences via one pulse generator. However, it is the common technical measure for a person skilled in the art to realize the above by two independent pulse sequence generators instead of the pulse generator for generating two pulse sequences. Thus, it is obvious for a person skilled in the art to obtain the technical solution of claim 12 by combining the above common technical measures based on Reference 1, therefore, claim 12 does not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law.

13. Claim 13 makes detailed definitions to the modulation mode of the pulse sequence. However, it is the common technical measures adopted by a person skilled in the art to adopt Biphase Shifting Keying method or Quadrature Phase shift keying method according to the specific demand of transmission while performing phase modulation. Thus, when claim 12 does not possess inventiveness, claim 13 does not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law either.

The “the pulse sequence for the signal 0” and “the pulse sequence for the signal 1” in claim 13 fail to appear in claim 12 referred to by it, which renders the protection scope of claim 13 unclear and does not comply with the provision of Rule 20, paragraph 1 of the Implementing Regulations of the Chinese Patent Law.

Claim 13 defines “BiPhase Shifting Keying (BPSK)” and “Quadrature Phase Shift Keying (QPSK)”, the “BPSK” and “QPSK” within the parentheses are the

abbreviations of the preceding contents, they are not reference signs, thus do not belong to the necessary situation within parentheses, therefore, the usage of the above parentheses is not appropriate, which does not comply with the provision of Rule 20, paragraph 4 of the Implementing Regulations of the Chinese Patent Law. The applicant should delete the parentheses and define said descriptions directly as “BiPhase Shifting Keying BPSK” and “Quadrature Phase Shift Keying QPSK”.

14. The independent claim 14 is for a UWB pulse sequence generator, whereas Reference 1 has disclosed a method and apparatus for detecting an UltraWide Band pulse signal with the detailed technical features as follows (refer to lines18 to 31 of page 14 of the specification and Figure 7): the code source 612 generates a pseudo random code 614; a precision timing generator 608 generates a modulated, coded timing signal 618 according to 614 and the transmission information signal 616; a pulse generator 622 generates output pulses using the modulated, coded timing signal 618. Although Reference 1 fails to disclose directly that generating the different first pulse sequence and second pulse sequence, the pulse generator must generate the different output sequences when the information to be transmitted are different. Thus Reference 1 has disclosed implicitly that the pulse generator has the function of generating a first pulse sequence and a second pulse sequence. Thus it can be seen that the distinctive technical features between claim 14 and Reference 1 lie in that: claim 14 has two pulse sequence generators, wherein the second pulse sequence generator is for generating a second pulse sequence by changing the pulse width; whereas Reference 1 has one pulse generator, and which is for generating different pulse sequences by changing the pulse positions. Reference 2 discloses a data transmission method with the detailed technical features as follows (refer to paragraph 0004 to paragraph 0005 of the specification and Figure 3B): data “0” and “1” of the signal sequences transmitted by the wireless remote control are distinguished by the ratio of different pulse widths of L and H levels. Thus it can be seen that using the pulse width to distinguish signals has been disclosed in Reference 2, furthermore, said feature performs identical functions in Reference 2 and the present invention, that is, Reference 2 has provided the inspiration of applying said distinctive technical feature into the technical solution of Reference 1 so as to further solve the technical problem. And it is the common technical measure for a person skilled in the art to realize the above by two independent pulse sequence generators instead of the pulse generator for generating two pulse sequences. Therefore, it is obvious for a person skilled in the art to obtain the technical solution of claim 14 by combining Reference 2 based on Reference 1. Thus, claim 14 does not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law.

An error referring to Chinese expressions occurs in claim 14, details omitted.

15. Claims 26 and 28 are the method claims correspond to the product claims 12 and 14 in essence, and their steps correspond to the constituting components of the apparatuses in claims 12 and 14, thus referring to the comments on claims 12 and 14,

claims 26 and 28 do not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law either.

16. Claim 27 makes detailed definitions to the modulation mode of the pulse sequence. However, it is the common technical measures adopted by a person skilled in the art to adopt Biphase Shifting Keying method or Quadrature Phase shift keying method according to the specific demand of transmission while performing phase modulation. Thus, when claim 26 does not possess inventiveness, claim 27 does not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law either.

17. An error referring to Chinese expressions occurs, details omitted.

### III. Claims 15 to 25

18. The independent claim 15 is for a wireless data transmitting/receiving method, whereas Reference 1 has disclosed a method and apparatus for detecting an UltraWide Band pulse signal with the detailed technical features as follows (refer to lines 18 to 31 of page 14, line 25 of page 15 to line 2 of page 16, lines 8 to 17 of page 16 of the specification and Figures 7 and 8): transmitting terminal code source 612 generates a pseudo random code sequence 614 (corresponds to step a in claim 15); a precision timing generator 608 generates a modulated, coded timing signal 618 according to 614 and the transmission information signal 616; a pulse generator 622 generates output pulses using 618 (corresponds to step b in claim 15); receiving terminal template generator 728 produces a train of template signal pulses 730 (corresponds to step c in claim 15); antenna 704 receives a propagated impulse radio signal 706 and generates reception signal pulse sequence 708; a cross-correlator 710 multiplies and integrates 730 and 708, so as to obtain the initial position of 708 (corresponds to the step d in claim 15); a detector 738 compares the pulses obtained from the output of 710 and the output signal 739 with a reference signal so as to determine the transmission information indicated by the received pulse sequence. The distinctive technical features between claim 15 and the contents disclosed in Reference 1 lie in that in claim 15, after step d, generating reference pulse sequences for a signal 0 and a signal 1 based on the start point information regarding the random number sequence, comparing the reference pulse sequences for the signal 0 and the signal 1 with the received random-interval pulse sequence so as to determine whether the received random-interval pulse sequence indicates 0 or 1; whereas Reference 1 is for detecting a pulse sum signal obtained by integrating all the pulses constituting a single data bit in the reception sequence pulses, comparing said signal with a standard reference value, and determining the transmission information indicated by the received pulse sequences. Reference 2 discloses a data transmission method with the detailed technical features as follows (refer to paragraph 0004 to paragraph 0005 of the specification and Figures 3B and 5 of the family patent application EP 1235400 of CN 1394422A): data “0” and “1” of the signal sequences transmitted by the wireless remote control are distinguished by the ratio of different pulse widths of L and H

levels, the reception side starts to recognize the reception waveform at the start point of it, and determines whether the received data is data 0 or data 1 according to whether the ratio of widths of pulses of the reception waveforms conforms to the 0's and 1's standard. Although Reference 2 fails to disclose directly the step of first generating the reference pulse waveforms for data 0 and data 1, if the reception side wants to perform identification judgment, it must first acquire the reference pulse waveform for 0 and 1 and then perform comparison according to the reference pulse waveform for 0 and 1. Thus, Reference 2 has disclosed implicitly the step of first generating the reference pulse waveform and then performing determination and judgment. Thus it can be seen that the above distinctive technical features have been disclosed in Reference 2, furthermore, they perform identical functions in Reference 2 and the present invention, both for first generating different reference pulses, then comparing it with the reception pulses to identify the reception data. That is, Reference 2 has provided the inspiration of applying said distinctive technical features into the technical solution of Reference 1 so as to further solve the technical problem. Therefore, it is obvious for a person skilled in the art to obtain the technical solution of claim 15 by combining Reference 2 based on Reference 1. Thus, claim 15 does not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law.

19. The additional technical feature of claim 16 is that: the random-interval pulse sequence is generated at a UWB, which has been disclosed by Reference 1 (refer to lines 16 to 23 of page 8 of the specification and Figures 2A and 2B). Thus, when claim 15 does not possess inventiveness, claim 16 does not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law either.

20. Claim 17 further defines the generation method of the random-interval pulse sequence in step (b), whereas Reference 1 has disclosed the method for phase modulating the pulse sequences (refer to lines 20 to 22 of page 9 of the specification). Thus, when claim 15 does not possess inventiveness, claim 17 does not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law either.

21. Claim 18 further defines the generation method of the reference template pulse sequence in step (c), whereas Reference 1 has disclosed the method for generating template signal pulse sequence 730 by using the random code similar to transmitting terminal 602 (refer to lines 28 to 30 of page 15 of the specification). Thus, when claim 15 does not possess inventiveness, claim 18 does not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law either.

22. Claim 19 further defines the method for detecting start point information in step (d), whereas Reference 1 has further disclosed the following technical features (refer to lines 4 to 27 of page 21 of the specification and Figure 10): shift integrating and summing (i.e. convoluting) the reception signal pulse sequence and the template pulse sequence via an integrator, if the output result is approximately diagonal and the final value is bigger than or equal to a threshold, it is assumed that the initial position of the

reception signal pulse sequence aligns with the template pulse sequence. As for the pulse sequence, the impulse response is also a pulse sequence, and the convolution of the time signal and the impulse response in the time domain corresponds to the power spectrum or energy spectrum of said signal in the frequency domain, which is the common knowledge in the art. Therefore, when claim 15 does not possess inventiveness, claim 19 does not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law either.

23. Claim 20 makes further definitions to the reference pulse sequence generated in step (e), Reference 1 has disclosed the method for phase modulating the pulse sequences (refer to lines 20 to 22 of page 9 of the specification). Thus, when claim 15 does not possess inventiveness, claim 20 does not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law either.

24. Claim 21 makes further definitions to the reference pulse sequences generated in step (e), whereas Reference 2 has disclosed the method for performing pulse width modulation on different data signals (refer to paragraph 0004 to paragraph 0005 of the specification and Figures 3B and 5). Thus, when claim 15 does not possess inventiveness, claim 21 does not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law either.

25. The independent claim 22 is for a wireless data receiving method, whereas Reference 1 has disclosed a method and apparatus for detecting an UltraWide Band pulse signal with the detailed technical features as follows (refer to line 25 of page 15 to line 2 of page 16, lines 8 to 17 of page 16 of the specification and Figure 8): receiving terminal template generator 728 produces a train of template signal pulses 730 (corresponds to step a in claim 22); antenna 704 receives a propagated impulse radio signal 706 and generates reception signal pulse sequence 708; a cross-correlator 710 multiplies and integrates 730 and 708, so as to obtain the initial position of 708 (corresponds to the step b in claim 22); a detector 738 compares the pulses obtained from the output of 710 and the output signal 739 with a reference signal so as to determine the transmission information indicated by the received pulse sequence. The distinctive technical features between claim 22 and the contents disclosed in Reference 1 lie in that in claim 22, after step (c), generating reference pulse sequences for a signal 0 and a signal 1 based on the start point information regarding the random number sequence, comparing the reference pulse sequences for the signal 0 and the signal 1 with the received random-interval pulse sequence, so as to determine whether the received random-interval pulse sequence indicates 0 or 1; whereas Reference 1 is for detecting a pulse sum signal obtained by integrating all the pulses constituting a single data bit in the reception sequence pulses, comparing said signal with a standard reference value, and determining the transmission information indicated by the received pulse sequences. Reference 2 discloses a data transmission method with the detailed technical features as follows (refer to paragraph 0004 to paragraph 0005 of the specification and Figures 3B and 5): data “0” and “1” of the signal sequences

transmitted by the wireless remote control are distinguished by the ratio of different pulse widths of L and H levels, the reception side starts to recognize the reception waveform at the start point of it, and determines whether the received data is data 0 or data 1 according to whether the ratio of widths of pulses of the reception waveforms conforms to the 0's and 1's standard. Although Reference 2 fails to disclose directly the step of first generating the reference pulse waveforms for data 0 and data 1, if the reception side wants to perform identification judgment, it must first acquire the reference pulse waveform for 0 and 1 and then perform comparison according to the reference pulse waveform for 0 and 1. Thus, Reference 2 has disclosed implicitly the step of first generating the reference pulse waveform and then performing determination and judgment. Thus it can be seen that the above distinctive technical features have been disclosed in Reference 2, furthermore, they perform identical functions in Reference 2 and the present invention, both for first generating different reference pulses, and then comparing it with the reception pulses to identify the reception data. That is, Reference 2 has provided the inspiration of applying said distinctive technical features into the technical solution of Reference 1 so as to further solve the technical problem. Therefore, it is obvious for a person skilled in the art to obtain the technical solution of claim 22 by combining Reference 2 based on Reference 1. Thus, claim 22 does not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law.

26. The additional technical features of claims 23 to 25 correspond to those of claims 16, 20 and 21, thus based on similar reasons as the comments on claims 16, 20 and 21, when claim 22 does not possess inventiveness, claims 23 to 25 do not possess inventiveness as prescribed in Article 22, clause 3 of the Chinese Patent Law either.

#### IV. Claims 29 to 30

27. Claims 29 and 30 are for "a computer readable recording medium", which are for "recording the program for executing the UWB pulse generation method", whereas computer programs fall into the scope of rules and methods for mental activities as prescribed in Article 25, clause 1, item (2) of the Chinese Patent Law and do not belong to the object that may be provided the patent protection, therefore, claims 29 and 30 can not be granted a patent right.

28. An error referring to Chinese expressions occurs in claim 30, details omitted.

Based on the above reasons, claims 1 to 28 of the present application do not possess inventiveness, claims 29 and 30 belong to the object where no patent right shall be granted regulated by the Chinese Patent Law; in the mean time, the specification does not record any other substantive content that can be granted a patent right, thus, even if the applicant rearranges the claims or makes further definitions according to the contents recorded in the specification, the present application does not have the prospect of being granted a patent right. If the applicant fails to bring forward

sufficient reasons to prove that the present application does possess inventiveness within the response time limit designated in this Office Action, the present application will be rejected.

Examiner: Lu Yanping

LHY

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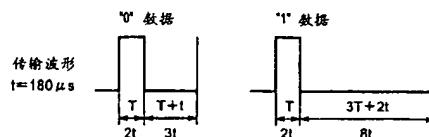
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权利要求书 1 页 说明书 8 页 附图 5 页

[54] 发明名称 数据传输方法和数据传输设备

[57] 摘要

一个通过简单的微型计算机处理来抑制通信差错的数据传输方法。使用一个有 H 电平和 L 电平的脉冲信号。其中一个电平的脉冲持续时间是第一基本信号长度  $T_1$ , 而另一个的持续时间是第二基本信号长度  $T_2$ , 它是第一基本信号长度  $T_1$  的整数倍, 因而构成一个特定的数据片。第二基本信号长度  $T_2$  通过增加/减小一个长度被校正, 此长度是传输侧脉冲信号的第一基本信号长度  $T_1$  被一整数除后的商的整数倍。



I S S N 1 0 0 8 - 4 2 7 4

1. 一种数据传输方法，其中特定的数据由 H 和 L 电平组成，其中的任意一个有一个被取为第一基本信号长度 ( $T_1$ ) 的脉冲宽度，而另一个则有一个被取为第二基本信号长度 ( $T_2$ ) 的脉冲宽度，它等于第一基本信号长度 ( $T_1$ ) 的整数倍，该方法包含对第二基本信号长度 ( $T_2$ ) 增加或减小一个长度来执行校正的步骤，该长度等于传输侧脉冲信号的第一基本信号长度 ( $T_1$ ) 被一整数除后产生的值的整数倍。

2. 根据权利要求 1 的数据传输方法，其中校正被应用于红外遥控装置的脉冲信号。

10 3. 一种数据传输设备，其中特定的数据由 H 和 L 电平组成，其中的任意一个有一个被取为第一基本信号长度 ( $T_1$ ) 的脉冲宽度，另一个有一个被取为第二基本信号长度 ( $T_2$ ) 的脉冲宽度，它等于第一基本信号长度 ( $T_1$ ) 的整数倍，该设备包含：  
除法装置，用来确定传输侧脉冲信号的第一基本信号长度 ( $T_1$ ) 被一整数除后产生的值；和  
校正装置，用来执行对第二基本信号长度 ( $T_2$ ) 增加或减小一个长度的校正，该长度等于被除法装置确定的值的整数倍。

## 数据传输方法和数据传输设备

### 5 技术领域

本发明涉及一种数据传输方法和一种数据传输设备，用于通过 H 和 L 电平的脉冲宽度来构造特定数据。

### 背景技术

目前，随着装备有红外辐射类型无线遥控装置（在下文中简称红外遥控装置）的家用电器的推广，已经出现了一个问题，即产品可能会错识其它厂商的信号或来自其它产品的信号，结果就导致故障。由于此原因，家用电器协会（AEHA）希望通过为红外遥控装置规定数据传送信号格式来阻止这种故障的发生。以下描述了由家用电器协会定义的这种信号格式的结构。

15 图 2 示出了信号格式的结构。如图所示，信号序列主要由一个指示此信号序列开始的引导 L、一个识别提供该产品的公司的常规编码 C ( $C_0, C_1$ )、一个奇偶性 P、一个指示被传达的特定信息的数据代码 D ( $D_1-D_n$ ) 和一个指示信号序列结束的尾标 TR 组成。这些部分以这种顺序传递来执行一个控制命令。对于这些信号，图 3A-3C 示出了被标准化的主要脉冲信号的形状。即是，图 3A 示出了在引导部分 L 的脉冲信号的形状，图 3B 示出了在数据代码部分 D 的脉冲信号的形状，和图 3C 示出了在尾标部分 TR 的脉冲信号的形状。这些信号由宽度是基本信号长度 T 的整数倍的脉冲组成。如图所示，一个由 H 和 L 电平组成的基本上矩形的脉冲信号被设计成依赖于 H 电平脉冲宽度和 L 电平脉冲宽度构成特定数据，因此已经被传送和接收的信号可以通过检测这些脉冲宽度被识别。特别地，如图 3A 所示，如果 H 电平脉冲宽度与 L 电平脉冲宽度的比是 8T: 4T 的信号被传送，这个信号就被确定为指示信号序列的开始的引导 L。如图 3C 所示，如果 H 电平脉冲宽度是 T，而 L 电平脉冲宽度是 8ms 或更长的信号被传送，这个信号就被确定为是指示信号序列的结束的尾标 TR。

同时，如图 3B 所示，指示信息的数据代码部分 D 中的脉冲波形依赖于“0”和“1”数据如何组合。通过 H 电平脉冲宽度和 L 电平脉冲

宽度来区别每个数据。即是，如果 H 电平脉冲宽度与 L 电平脉冲宽度的比是 T: T (1: 1)，那么接收到的数据就被认为是“0”数据。如果 H 电平脉冲宽度与 L 电平脉冲宽度的比是 T: 3T (1: 3)，那么接收到的数据就被认为是“1”数据。也规定了，“0”数据的相应电平脉冲宽度之和与“1”数据的相应电平脉冲宽度之和的比应该是 1: 2。而且，基本信号长度 T 被规定落在  $T=350 \mu s - 500 \mu s$ ,  $3T=1050 \mu s - 1500 \mu s$  的范围内。

在这个连接中，有一个问题是，如果数据代码部分 D 的脉冲信号以信号格式规定的精确波形被传送，那么就容易发生通信差错，因为取决于红外光电探测器的特性、降低噪声的电容器等，如图 5 所示，在接收侧的波形整个被钝化，结果就导致了波形开/关定时的漂移。更特别地，被接收侧的微型计算机识别的波形受门限设置的影响，出现了在传输侧的 H 电平脉冲宽度被识别得长一些，而 L 电平脉冲宽度则短一些的趋势。因此，接收侧的波形可能不会满足被规定的基本信号长度范围  $T=350 \mu s - 500 \mu s$  以及单个脉冲宽度间的比率的要求，这是一个问题。

如图 6A-6D 所示，可以想象的是采用一种方法，其中传输侧波形的 L 电平脉冲宽度被设置成比它的 H 电平脉冲宽度长，更特别地，采用一种方法，其中在传送前 L 电平脉冲宽度被校正为 H 电平脉冲宽度的一个整数倍。即是，在这种方法中，在传输侧，如图 6A 所示，传输波形中用于“0”数据的 H 电平脉冲宽度与 L 电平脉冲宽度之比被设置为 T: 2T，以及如图 6B 所示，用于“1”数据的 H 电平脉冲宽度与 L 电平脉冲宽度之比被设置为 T: 5T。这样的结果是，在接收侧，在接收波形中用于“0”数据和“1”数据的 H 电平脉冲宽度与 L 电平脉冲宽度之比通常变成 1: 1 和 1: 3，分别如图 6C 和 6D 中所示。但在这种情况下，出现了一个问题，就是单个传输侧数据的脉冲宽度达不到标准值范围。即是，尽管单个数据的标准值是  $T=350 \mu s - 500 \mu s$  和  $3T=1050 \mu s - 1500 \mu s$ ，但像上面所显示出的，把 T 校正为 2T，把 3T 校正为 5T 的如此大范围的校正将会引起一个问题，就是产生的传输波形偏离了上面的标准值范围。

作为其它对策，还有一些其它的方法，其中接收侧的校正不是通过以接收侧波形的一般中心处设置的门限确定脉冲宽度来实现，而是

通过实施接收侧校正，例如通过在波形的上升和下降沿确定脉冲宽度或通过使接收侧抽样间隔短些，或其它方法来实现。但在这些方法中，波形本身已经由于噪声或类似的影响而变形，从而在校正被实施于传输侧的情况下，会引起性能变差的问题。

## 5 发明内容

本发明已经被实现来解决现有技术的上述缺陷，本发明的目的之一是提供一种能够通过简单的微型计算机处理来抑制通信差错的数据传输方法。

为了实现上述的目的，提供了一种数据传输方法，其中特定数据由 H 和 L 电平组成，其中的任意一个有一个被取为第一基本信号长度 (T<sub>1</sub>) 的脉冲宽度，而另一个则有一个被取为第二基本信号长度 (T<sub>2</sub>) 的脉冲宽度，它等于第一基本信号长度 (T<sub>1</sub>) 的整数倍，该方法包含对第二基本信号长度 (T<sub>2</sub>) 增加或减小一个长度来执行校正的步骤，此长度等于传输侧脉冲信号的第一基本信号长度 (T<sub>1</sub>) 被一整数除后产生的值的整数倍。

在本发明的一个实施方案中，校正被应用于红外遥控装置的脉冲信号。

在这个数据传输方法中，校正通过对第二基本信号长度增加或减小一个长度来执行，此长度等于传输侧脉冲信号的第一基本信号长度被一整数除后产生的值的整数倍。这使得用精确的步骤为单个信号电平的脉冲宽度的长度设置校正量成为可能。这样的结果是，选择使得单个信号电平的脉冲宽度的标准值让人满意的校正量变为可能。此外，由于第二基本信号长度的校正量是由一个等于第一基本信号长度被一整数除后产生的值的整数倍的长度给出，所以微型计算机处理可以被简化。

同样提供了一台数据传输设备，其中特定数据由 H 和 L 电平组成，其中的任意一个有一个被取为第一基本信号长度 (T<sub>1</sub>) 的脉冲宽度，而另一个则有一个被取为第二基本信号长度 (T<sub>2</sub>) 的脉冲宽度，该长度等于第一基本信号长度 (T<sub>1</sub>) 的整数倍，该设备包含：

30 除法装置，用来确定传输侧脉冲信号的第一基本信号长度 (T<sub>1</sub>) 被一整数除后产生的值；和

校正装置，用来执行对第二基本信号长度 (T<sub>2</sub>) 增加或减小一个长

度的校正，该长度等于被除法装置确定的值的整数倍。

在这个数据传输设备中，校正用以下的方式完成。除法装置确定一个由传输侧脉冲信号的第一基本信号长度被一整数除后产生的值，而校正装置对第二基本信号长度增加或减小一个等于被除法装置确定的值的整数倍的长度。这使得用精确的步骤为单个信号电平的脉冲宽度的长度设置校正量成为可能。这样的结果是，选择使得单个信号电平的脉冲宽度的标准值让人满意的校正量变为可能。此外，由于第二基本信号长度的校正量是由一个等于第一基本信号长度被一整数除后产生的值的整数倍的长度而给出，所以配备有这种数据传输设备的微型计算机的处理可以被简化。

#### 附图简述

图 1A-1D 是显示根据本发明的数据传输方法的一个实施方案的、脉冲信号波形的形状的示意性框图；

图 2 是用于解释数据传输方法的信号格式的一个结构框图；

图 3A-3D 是显示不同脉冲信号波形的形状的示意性框图；

图 4 是显示根据本发明的数据传输设备的一个实施方案的、传送信号处理流的流程图；

图 5 是显示根据现有技术的数据传输方法的说明性图示；以及

图 6A-6D 是显示根据现有技术的数据传输方法的说明性图示。

#### 实现本发明的最佳模式

现在将结合附图就本发明的数据传输方法的具体实施方案进行详细描述。

图 1A-1D 是显示根据本发明的数据传输方法的一个实施方案的、脉冲信号波形的形状的示意性框图。信号格式的组成和各种类型信号脉冲的标准通常都和上面所示的现有技术的那些类似，因此它们的描述就被忽略了。要注意的是，此实施方案中的数据传输方法是被应用于并入家用电器中的微型计算机和红外遥控装置之间的数据传输。

图 1A-1D 示出一个实例，其中传输波形被校正使得接收侧的波形符合家用电器协会规定的标准。图 1A 和 1B 分别示出了从传输侧的红外遥控装置得到的“0”数据和“1”数据的波形。图 1C 和 1D 分别示出了被接收侧的微型计算机识别的“0”数据和“1”数据的波形。此实施方案使用了一个校正方法，即 L 电平脉冲宽度被增加了一个长度（基

本单元长度  $t$ ），该长度等于传输侧 H 电平脉冲宽度被一整数除后产生的值的整数倍。在下文里，就用于传输波形的“0”数据的校正方法作具体解释。首先，在符合“0”数据标准的传输波形中（见图 3B），H 电平脉冲宽度被取为第一基本信号长度  $T_1$ （没有示出），此第一基本信号长度  $T_1$  被 2 除后的值被取为基本单元长度  $t$ 。接着，执行校正，把这个基本单元长度  $t$  加到第二基本信号长度  $T_2$ （没有示出），即 L 电平脉冲宽度上，其结果被取为新的 L 电平脉冲宽度（见图 1A）。由于“0”数据中的  $T_1$  和  $T_2$  基本上有一个关系  $T_1=T_2$ ，可以假设  $T_1=T_2=T$ 。从这个关系上，传输波形中的 H 电平脉冲宽度与 L 电平脉冲宽度之比可被表示为如图 1A 所示的  $T: T+t$  ( $2t: 3t$ )。当此数据被传送时，就会获得如图 1C 所示的波形，其中在接收侧 H 电平脉冲宽度与 L 电平脉冲宽度之比通常为 1: 1。

同样地，对于“1”数据，在满足“1”数据标准的传输波形中（见图 3B），H 电平脉冲宽度被取为第一基本信号长度  $T_1$ ，它被 2 除后的长度被取为基本单元长度  $t$ 。接着，执行校正，把长度  $2t$ （此基本单元长度  $t$  的两倍）加到第二基本信号长度  $T_2$ ，即 L 电平脉冲宽度上，其结果被取为新的 L 电平脉冲宽度（见图 1B）。由于“1”数据中的  $T_1$  和  $T_2$  基本上有一个关系  $3T_1=T_2$ ，可以假设  $T_2=3T_1=3T$ 。从这个关系上，传输波形中的 H 电平脉冲宽度与 L 电平脉冲宽度之比可被表示为如图 20 1B 所示的  $T: 3T+2t$  ( $2t: 8t$ )。当此数据被传送时，就会获得如图 1D 所示的波形，其中在接收侧 H 电平脉冲宽度与 L 电平脉冲宽度之比通常为 1: 3。

甚至在传输波形的校正中，也要进行考虑，使得“0”数据中的单个电平脉冲宽度之和与“1”数据中的单个电平脉冲宽度之和的比，在这种情况下即  $(T+T+t) : (T+3T+2t)$ ，达到比值为 1: 2 的要求。

下面，要讨论传输侧校正波形的每个脉冲宽度是否满足家用电器协会规定的标准。在此连接中，由于传输侧波形被校正使得传输侧波形中的每个电平的脉冲宽度有基本信号长度  $T_1$  和  $T_2$ ，分别落在范围  $T=350 \mu s - 500 \mu s$  和  $3T=1050 \mu s - 1500 \mu s$  中，接收波形可以说服从标准值范围。在下文中，检查传输侧被校验的单个数据的脉冲宽度是否落在标准值范围  $\pm 10\%$  内，即范围  $T=315 \mu s - 550 \mu s$  和  $3T=945 \mu s - 1650 \mu s$ 。在这个实施方案中，如图 1A 和 1B 所示，“0”数据的 L 电

平长度（第二基本信号长度  $T_2$ ）被校正到  $T+t$  ( $=3t$ )，此外“1”数据的 L 电平长度（第二基本信号长度  $T_2$ ）被校正到  $3T+2t$  ( $=8t$ )。因此，假定基本单元长度是  $t=180 \mu s$ ，把这个代替上面的值得到  $3t=540 \mu s$  和  $8t=1440 \mu s$ ，显示这些脉冲宽度值分别落在标准值范围 $\pm 10\%$ 内。因此，可以说被校正的传输波形基本符合标准值范围。

如上所示，本数据传输方法的实施方案包括以下校正，第二基本信号长度  $T_2$ ，也就是 L 电平脉冲宽度，被增加了一个长度，该长度等于在传输侧第一基本信号长度  $T_1$ （也就是 H 电平脉冲宽度）被一整数除后产生的值  $t$  的整数倍。结果，用于脉冲宽度的长度的校正量可以 10 用比传统方法（即一个电平的脉冲宽度被设置成其它电平的脉冲宽度的整数倍）更精确的步骤来设置。因此，就可能从由上述方法中获得的单个校正量中，选择使传输侧和接收侧的脉冲宽度都能符合标准值范围的适当的校正量。另外，由于接收侧噪声降低措施的自由度因 15 基本符合标准值的信号可如上面所述被发射和接收的实施的优点被提高，所以提供一个具有大噪声降低效果等的电容器成为可能。此外，由于信号的错误识别变得不大可能发生，所以通信差错率可以被降低。而且，由于第二基本信号长度  $T_2$  的校正量是由一个等于第一基本信号长度  $T_1$  被一整数除后产生的值的整数倍的长度给出，所以微型计算机的处理可以被简化。

图 4 显示了根据本发明的数据传输设备的一个实施方案的传送信号处理流。此数据传输设备通过有第一基本信号长度  $T_1$  的 H 电平宽度，以及是第一基本信号长度  $T_1$  整数倍（如，1 表示“0”数据，3 表示“1”数据）的第二基本信号长度  $T_2$  的 L 电平宽度（如， $T_1$  表示“0”数据， $3T_1$  表示“1”数据）的脉冲信号传送数据。此数据传输设备以图 4 所示的方式处理图 2 中的数据代码  $D_1, D_2, \dots, D_n$  部分的脉冲信号，然后传送它们，而图 2 中其它部分的信号，即引导 L，自定义码  $C_0, C_1$ 、奇偶 P 和尾标 TR 都与图 2 中一样。在红外遥控装置里的微型计算机（这里没有示出）包括除法装置 S1，用于确定传送脉冲信号的第一基本信号长度  $T_1$  被一整数除后产生的值，以及校正装置 S2，用于执行对第二基本信号长度  $T_2$  增加一个长度的校正，该长度等于被除法装置 S1 确定的值的整数倍。  
30 在图 4 中的步骤 S1，除法装置用一个整数（如 2）去除第一基本

信号长度  $T_1$  (也就是将被传送的脉冲信号的 H 电平宽度)，计算出一个值  $t (= T_1/2)$ 。接着在图 4 中的步骤 S2，校正装置把该计算出的值  $t$  的整数倍（如，1 表示“0”数据，2 表示“1”数据）加到第二基本信号长度  $T_2$ （如， $T_1$  表示“0”数据， $3T_1$  表示“1”数据），也就是将被传  
5 送的脉冲信号的 L 电平宽度。因此，例如，以 H 电平脉冲宽度与 L 电  
平脉冲宽度之比对于“0”数据是  $(T_1) : (T_1+t)$  或对于“1”数据是  $(T_1) : (3T_1+2t)$  的结果，代表数据的脉冲信号被传送到接收侧（见图 1A）。

从数据传输设备发出的脉冲信号被接收侧接收，正如结合图 1A 和  
10 3B 对本发明的数据传输方法的实施方案所描述的，在接收到的脉冲信  
号中，H 电平脉冲宽度与 L 电平脉冲宽度之比对于“0”数据通常为 1:  
1 或对于“1”数据通常为 1: 3。因此，每个 H 和 L 电平脉冲宽度符合  
家用电器协会在传输和接收侧规定的标准，与已经描述过的数据传输  
方法起到了相同的工作效果。

尽管本发明的数据传输方法和数据传输设备的具体实施方案已经在  
15 上文中被描述，但发明不应局限于这些实施方案。相反，在本发明的范围内，本发明可以多种方式实现。例如，尽管上述的实施方案包括以下校正，即第二基本信号长度  $T_2$ （也就是 L 电平脉冲宽度）被增加一个长度，该长度等于第一基本信号长度  $T_1$ （也就是传输波形的 H 电平脉冲宽度）被一整数除后产生的值  $t$  的整数倍，但可能执行一个  
20 相反的校正，即第二基本信号长度  $T_2$  被减少一个长度，该长度等于基本单元  $t$  的整数倍。此外，尽管上述的实施方案包括以下设置，即第一基本信号长度  $T_1$  被指定为 H 电平宽度，而第二基本信号长度  $T_2$  被指定为 L 电平宽度，然而上述校正方法也可能被应用到与上述实施方案相反的设置，即对于 H 电平宽度是 L 电平宽度整数倍的信号，第一基  
25 本信号长度  $T_1$  被指定为 L 电平宽度，而第二基本信号长度  $T_2$  被指定为 H 电平宽度。此外，尽管上述的实施方案已经通过一个校正被举例说明，其中表示传输波形的“0”数据的脉冲宽度之比被校正为  $T: T+t (2t: 3t)$ ，而表示传输波形的“1”数据的脉冲宽度之比被校正为  $T: 3T+2t (2t: 8t)$ ，但是本发明不应被局限于这种比率组合，可以选择各种  
30 校正量以达到被规定的标准值，例如，通过把第一基本信号长度  $T_1$  除以 4 ( $T=4t$ )，并将比率设置为  $T: T+2t (4t: 6t)$  表示“0”数据，而  $T: 3T+4t (4t: 16t)$  表示“1”数据。此外，尽管在上述情况下，传

输波形的校正已经被完成以致满足了家用电器协会规定的标准，但是校正量仍然可被确定以致满足其它标准的规定。此外，尽管上述的实施方案已经相对用红外遥控装置的传输方法被描述，本发明的方法仍然可以被应用到用有线遥控或类似的方法上。此外，尽管上述的

5 实施方案已经针对一个方法被描述，其中传送的波形在接收侧被倒转，即在波形被接收时把H电平作为L电平，而把L电平作为H电平的方法，本发明的方法也可应用于不包含波形倒转的方法，即用上述情况中的相同方式，在波形被接收时把H电平作为H电平，而把L电平作为L电平的方法。

10 根据本发明的数据传输方法和数据传输设备，由于用于信号电平的脉冲宽度的长度的校正量可以精确的步骤设定，所以就可能选择符合单个信号电平的脉冲宽度的标准值的校正量。此外，由于对第二基本信号长度的校正量被设置为一个等于第一基本信号长度被一整数除后产生的值的整数倍的长度，所以微型计算机的处理可以被简化。

15 另外，根据本发明，由于没有必要使用任何多个定时器，廉价的微型计算机就可以实施这个发明。

#### 工业实用性

本发明的数据传输方法和数据传输设备不仅能在家用电器上，还能在空调上应用。

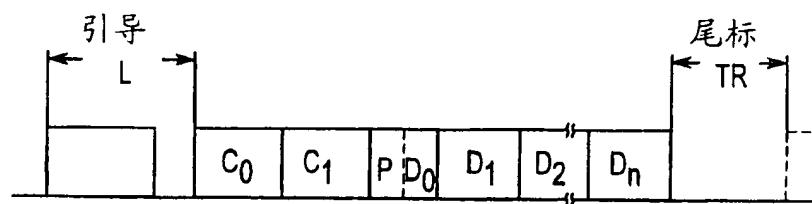
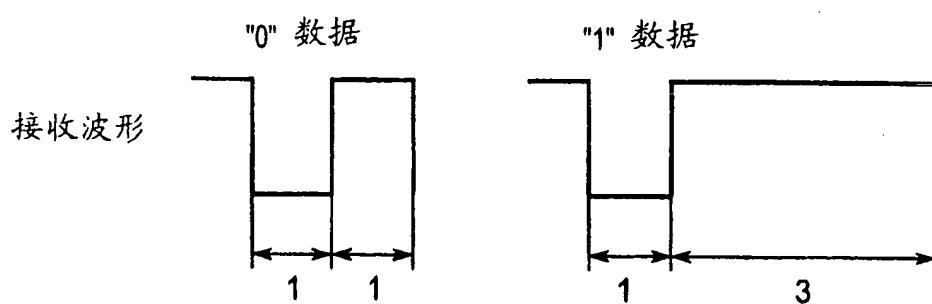
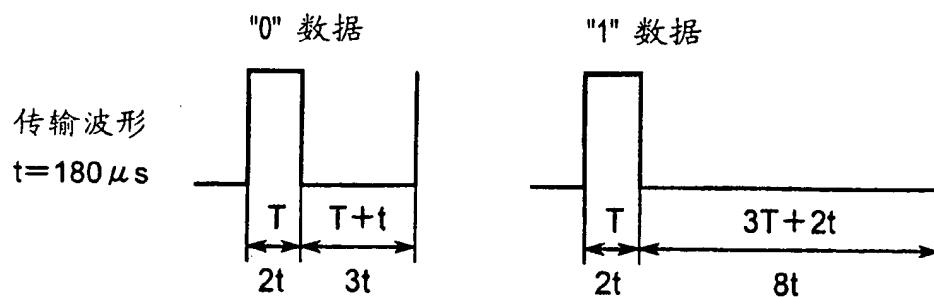


图 3A

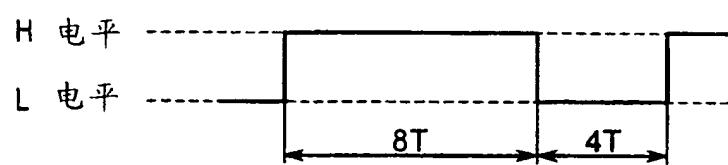


图 3B

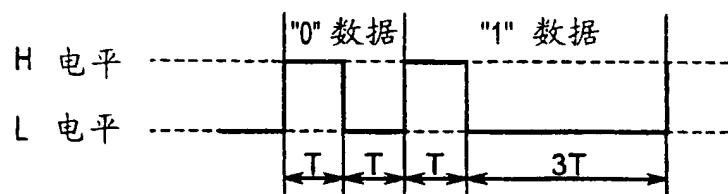
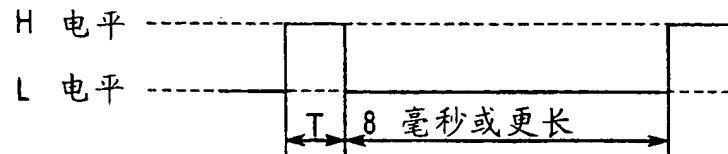


图 3C



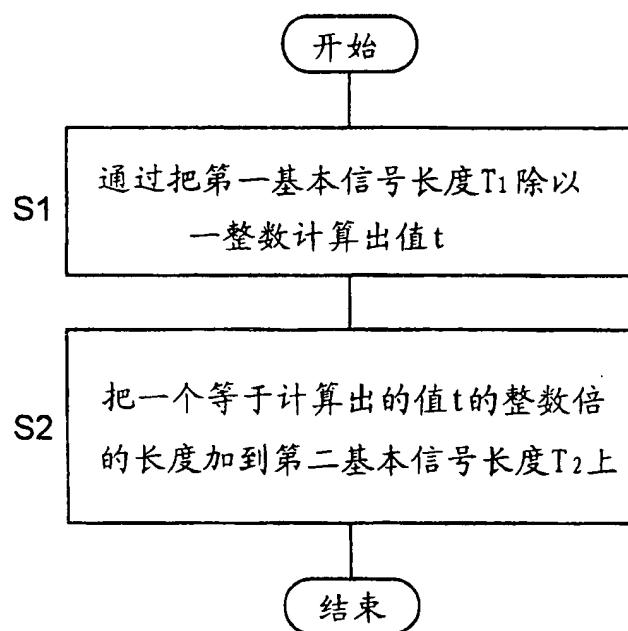


图 4

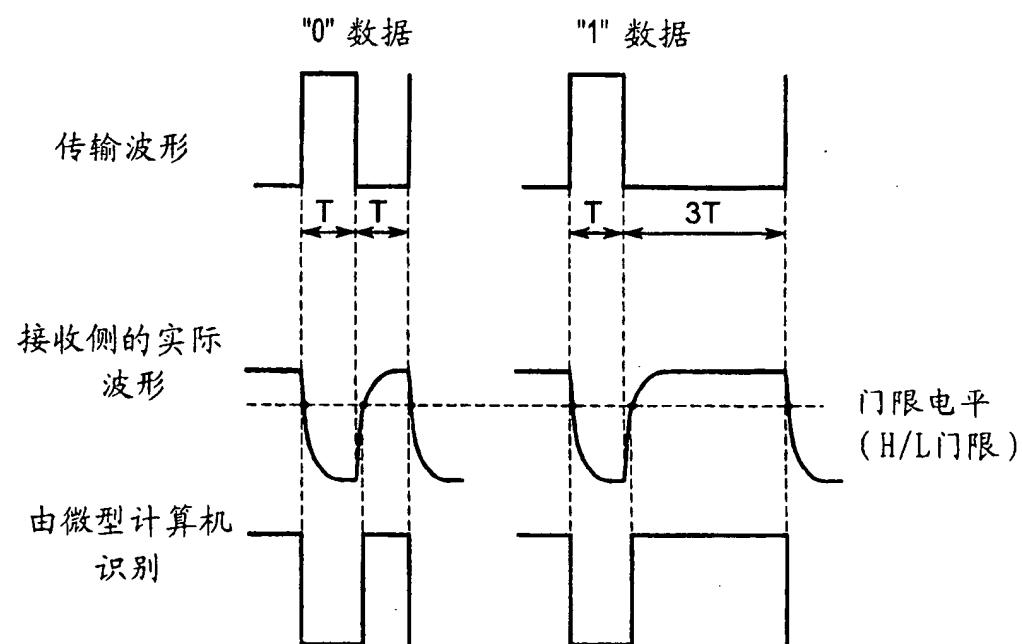


图 5

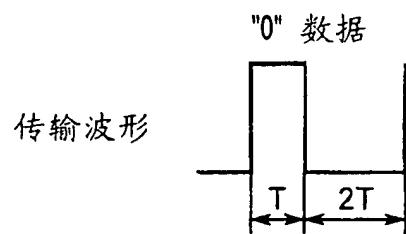


图 6A

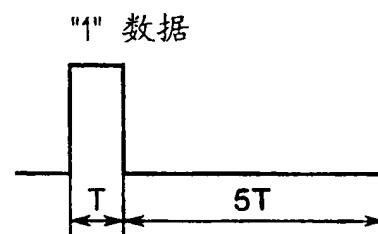


图 6B

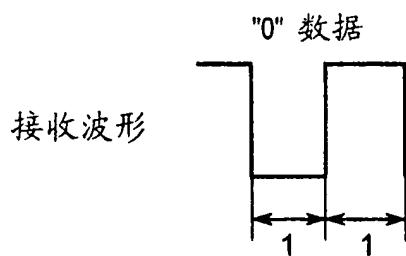


图 6C

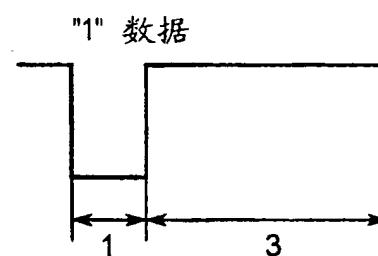


图 6D